Proportional Representation Society of Australia

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Your vote–

effective

or wasted?

In Australia

All adults have the right to vote
Voting is by secret ballot
Care is taken to keep electoral rolls accurate
There is provision for postal and absent voting
Arrangements for recording and counting votes are excellent

Yet

Most elections leave many people unrepresented

Some votes help to elect candidates, others have no effect and are wasted

Parties supported only by minorities of voters can win majorities of seats

In this brochure, electoral methods are examined and compared. The quota-preferential method of proportional representation is shown to be the only one that ensures accurate representation and provides a sound basis for good government.

Electing representative bodies

For the affairs of a society or a nation to be run efficiently, the people who form it must reach some kind of agreement on public questions. If they do this, they have a chance of getting action on things that need to be done, and of preventing things that would be harmful. If they fail, they leave the way open for individuals or groups of people to seize power, with consequences that depend on the motives, capability, and honesty of these people. The record of history does not encourage optimism about this kind of government.

It is possible for some questions of public interest to be decided directly by the people. But the conduct of a referendum on even a simple question is costly and slow and it would be quite unrealistic to suggest that all questions needing decision should be dealt with in this way. Democratic countries in general have accepted the idea of giving responsibility for government to elected bodies large enough to provide opportunity for the views of the people to be presented adequately but not so large as to make it difficult for decisions to be reached.

Since the decisions of elected governing bodies affect all those who elect them, it is important that the methods of election should be sound.

Good and bad methods

When members are elected to a Parliament or other representative body, their primary task is to represent people. As people usually have ideas about government, this means that their elected representatives will also represent ideas and opinions.
A good electoral method will give elected bodies that are likely to reach the same decisions as the voters themselves would reach if they had access to the same information. The Universal Declaration of Human Rights specifies that 'The will of the people shall be the basis of the authority of government'. This requires that each elected body should include spokesmen for the significant bodies of opinion among the voters and that the number representing each point of view should be in proportion to the number of voters supporting that view.

Much of the information that leads to a decision by a governing body does not come to the attention of its members until the question is debated. For good government, the voters must be represented by people who can discuss issues, and assess them as the voters would like to have them assessed. The issues that will arise during the term of a Parliament or committee can never be predicted with complete accuracy, so that the voters must rely on their representatives to deal with unforeseen situations.
If we aim at electing representatives who can retain the confidence of voters it is most important that each voter should have the opportunity to choose not only between policies but also between individual candidates.

The main requirements of a good electoral system are

- That it ensures that significant bodies of opinion among the voters are represented by effective spokesmen.

- That it results in the election of a number of spokesmen for each body of opinion proportional to the number of its supporters.

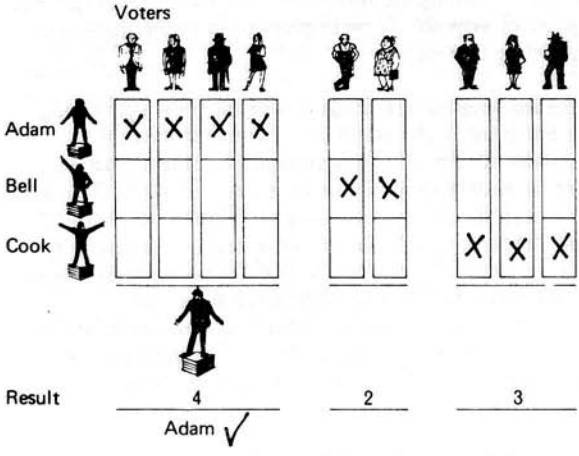
- That voters have the opportunity to select candidates for their personal qualities as well as for the policies they support.

No method of election that fails to meet any of these requirements is good enough for use in a democratic country or society.
A method that meets all of them is likely to give elected bodies that are genuinely supported by the voters, making strong, effective government possible.

Which is the right method?

For many Parliamentary elections, the country or state is divided into electoral districts equal in number to the number of seats to be filled. Each of these districts or electorates returns a single member. The two methods of election commonly used are the 'first-past-the-post' method and the majority-preferential method. When the first-past-the-post method is used, each voter is invited to put a cross on the ballot paper beside the name of the candidate he supports. The candidate with most supporters is elected.

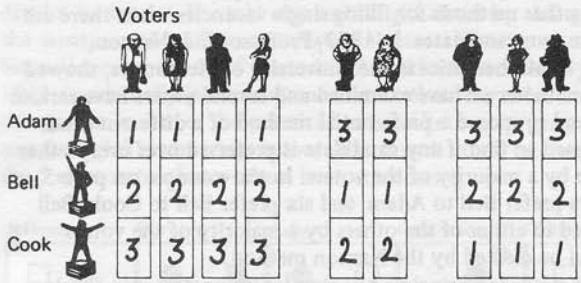
First-past-the-post method



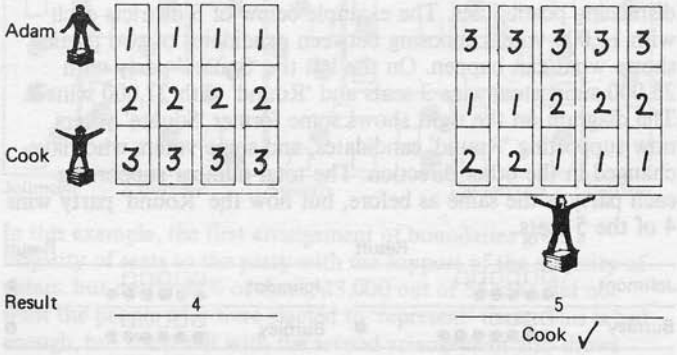
In this case, Adam is elected although more than half of the voters support other candidates.

The majority-preferential method was introduced with the idea of finding more accurately what the majority of the voters want. The voters put numbers beside the names of the candidates to indicate their order of preference. If any candidate has more than half of the first preferences, he is said to have an absolute majority and is elected. If not, the one with the smallest number is excluded and his votes are passed on to the candidates shown as second preferences. If any candidate now has a majority, he is elected. If not, the process is continued until one candidate has a majority. With the same voters and candidates the voting might have been like this.

Majority Preferential method



No candidate has more than half of the first preferences. So Bell, with only 2 first preferences, is excluded. Cook is shown as second preference on both of his votes. The papers are transferred to Cook.



Now Cook is elected. The voters have not changed their opinions, but the change of method has changed the result. As the two methods we have tried give different results, it is reasonable to ask if either result is right.

Is any single-member method satisfactory?

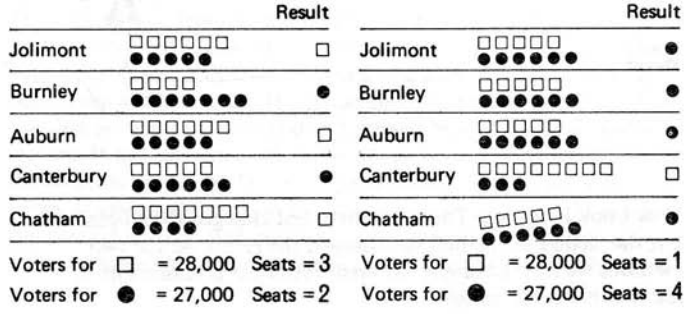
Besides the first-past-the-post and majority-preferential methods, there are other methods for filling single vacancies when there are more than two candidates. In 1882, Professor E.J. Nanson, Professor of Mathematics in the University of Melbourne, showed that the methods we have examined and several others have serious defects, and proposed a preferential method of a different kind. It is designed to find if any candidate is preferred over every other candidate by a majority of the voters. In the example on page 5, five voters prefer Bell to Adam, and six prefer Bell to Cook. Bell is preferred to either of the others by a majority of the voters and would be elected by the Nanson method.

A method similar in principle but simpler in practice was developed later by Dr. G.H. Hallett in America. Where single vacancies must be filled, as, for example, in the election of a president or secretary, these are probably the best methods available.

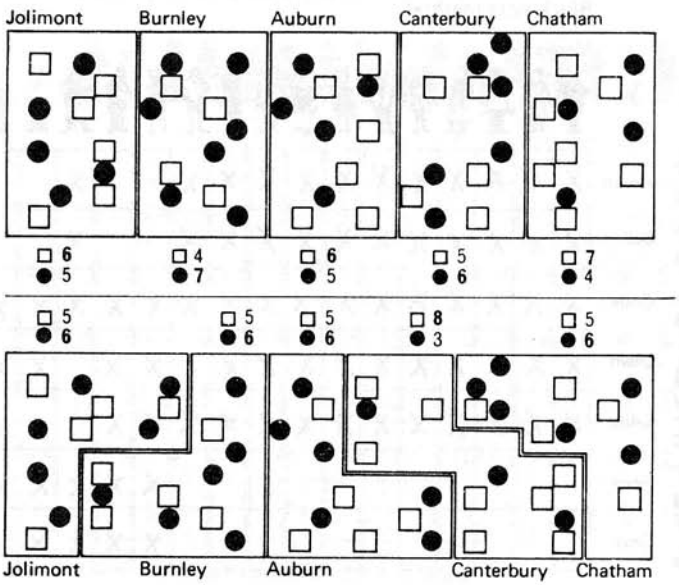
When only one candidate is elected from a parliamentary district, the result can be satisfactory only to supporters of the winning candidate, no matter which method is used. Some voters must be disappointed.

Two possible arrangements

When we look at the results of using several single-member districts to elect members from a larger area, we find other disturbing possibilities. The example below of 5 districts each with 11,000 voters choosing between candidates of two parties shows what can happen. On the left the 'Square' party with 28,000 supporters wins 3 seats and 'Round' with 27,000 wins 2. The diagram on the right shows some former 'Square' voters now supporting 'Round' candidates, and some voters who have changed in the other direction. The total number supporting each party is the same as before, but now the 'Round' party wins 4 of the 5 seats.



This kind of change can happen without people changing their minds at all. It could result from some of them moving from district to district. It could also be brought about by changes in the positions of boundaries between electoral districts.
Since Governor Gerry of Massachusetts did this successfully in 1812, incidentally producing one district that resembled a salamander in shape, the practice has been known as 'gerry-mandering'. The drawings below show how it could be done with the 5 electorates that we have been considering.



In this example, the first arrangement of boundaries gives a majority of seats to the party with the support of the majority of voters, but nearly 42% of them, 23,000 out of 55,000, did not want the people who were elected to 'represent' them. This is bad enough, but the result with the second arrangement also shows that a single-member system can allow a party supported by a minority of voters to win a majority of the seats. In practice, too, the single-member method usually restricts the voter's choice to parties, with no opportunity to choose between candidates within parties. We can only conclude that single-member district methods are all unsatisfactory for electing representative bodies. They fail to meet all three of the main requirements of a good electoral system.

Districts returning several members each

As single-member district methods are unsatisfactory for electing representative bodies, we should consider the possibility of electing members from districts large enough to return several members each. There are many ways of doing this. The two methods most commonly used are the 'block-vote' method (example below) and the 'majority-preferential' method (example page 9).

Block-vote method

Voters

Adam	X	X	X	X	X	X	X	X	X	X	X			X			
Bell	X	X	X	X	X	X	X	X	X	X	X			X			
Cook	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dean	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Eddy	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Ford												X	X	X	X	X	X
Gray												X	X	X	X	X	X

Result: Adam, Bell, Cook, Dean, Eddy - Elected

The block-vote method is similar to the 'first-past-the-post' method used for single vacancies. When several vacancies are to be filled, the voter is invited to put crosses beside the names of a number of candidates equal to the number of vacancies. In this example, 11 of the 17 voters have the satisfaction of seeing all of the vacancies filled by the 5 candidates they supported. As the method does not allow the voter to indicate his views about the relative merits of the candidates he supports, it is not possible to tell whether the result is satisfactory or not to the other 6 voters.

When the majority-preferential method is used, voters indicate their preferences for candidates by numbering as in the single-member preferential method. The vacancies are filled one at a time, each being filled by the person chosen from the available candidates by the 'majority'. When a candidate is elected, all of his votes are passed to the remaining candidates shown as next preferences, giving his supporters, in effect, another vote for the next vacancy.

Majority-preferential method

Adam	1	1	1	1	1	1	2	3	5	5	5	6	6	5	7	7	7
Bell	2	2	4	4	2	2	1	2	4	4	4	7	7	4	6	6	6
Cook	3	3	3	3	3	3	3	1	1	3	2	5	3	3	5	5	5
Dean	4	4	2	2	4	4	4	4	2	1	3	4	4	6	4	4	4
Eddy	5	5	5	5	5	5	5	5	3	2	1	3	5	7	3	3	3
Ford	6	6	7	6	6	6	7	7	6	7	7	1	1	1	1	2	2
Gray	7	7	6	7	7	7	6	6	7	6	6	2	2	2	2	1	1

Result: Adam, Bell, Cook, Dean, Eddy- Elected

The example shows how the ballot papers might have looked with the same voters and candidates as in the block-vote example. Counting takes quite a lot of trouble but gives the same result in this case as the block-vote method. It is clear now that although 11 voters see their first-preference candidates elected, neither the first nor the second preferences of the other 6 are elected. The method has failed to give effective representation to a significant body of opinion among the voters. All of the methods we have examined so far have failed to meet the requirements set out on page 3. We must find something better.

Effective representation

The method that is now known as the quota-preferential method of proportional representation was first suggested in about 1820 by Thomas Hill, a Birmingham schoolmaster whose son Rowland became Secretary of the Colonization Commission of South Australia and later reformed the British postal system. We are told that Hill Senior encouraged the boys in his school to use his method in the election of a committee. Although there is no detailed record of this election, it could have been somewhat as shown on page 11.

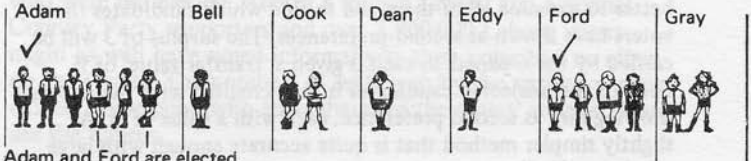
With 17 boys voting to appoint a committee of 5 from 7 candidates, we can imagine the schoolmaster pointing out that any candidate supported by 3 or more boys should be elected. Not more than 5 could each have 3 or more supporters and this means that anyone with 3 or more supporters must be among the 5 finally elected. This number of votes necessary for election is known as the 'quota'. At the end of the election, 15 of the boys are grouped into 5 quotas and there are 2 boys left over. In fact, one of these is one who had originally supported the first candidate elected. The result then is that 15 of the 17 boys see their first-preference candidates elected and only one is disappointed.

In this case, every boy could see how the others voted. It was shown later by Thomas Hare in England and Carl Andrae in Denmark that the same method could be used with secret voting. Voters can show by preference markings on ballot papers which candidates they support and where they would transfer their support if it was not needed by their first-preference candidates. In fact, if the boys had voted in this way, the ballot papers might have looked exactly like those on page 9. Instead of the boys grouping themselves in support of candidates and eventually arranging themselves in quotas, the ballot papers would be examined and the counting carried out as shown on page 11. Each stage of counting corresponds exactly to one stage in the schoolboys' election.

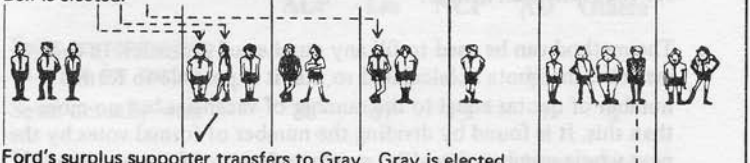
With 16 voters out of 17 satisfied, this result is much better than with the majority-preferential method, which left 6 of the 17 disappointed. Each voter had a wide choice of candidates and bodies of opinion are represented by spokesmen in numbers proportional to the numbers supporting them, since each candidate elected is supported by a quota of voters.

Quota-preferential method

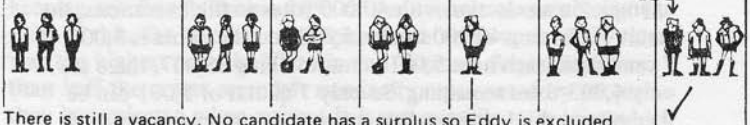
A class of 17 boys is to elect a committee of 5 from 7 candidates.
The supporters of each candidate stand together.



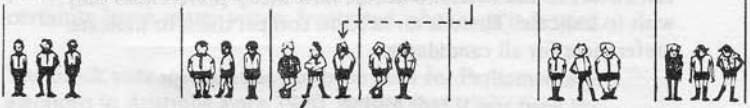
Adam and Ford are elected.
Adam's surplus supporters transfer their support to Bell and Dean.
Bell is elected.



Ford's surplus supporter transfers to Gray. Gray is elected.



There is still a vacancy. No candidate has a surplus so Eddy is excluded.
His one supporter moves to Cook. Cook is elected.



Adam	Bell	Cook	Dean	Eddy	Ford	Gray	
6 ✓	1	2	1	1	4 ✓	2	First preferences
3	3 ✓	2	2	1	4	2	A's Surplus
3	3	2	2	1	3	3 ✓	F's Surplus
3	3	✓3	2		3	3	E Excluded

This method has been developed for use in elections of all sizes, and several refinements have been introduced to make it as accurate and effective as possible. For example, in transferring Adam's surplus, it is not necessary to make an arbitrary selection of 3 of the ballot papers showing Adam as first preference. It is better to examine all of them and to find which candidates the voters have shown as second preferences. The surplus of 3 will be carried by the 6 papers so each is given a 'transfer value' of ½. Each of the unelected candidates is then credited with the papers showing him as second preference, each with a value of ½. A slightly simpler method that is quite accurate enough with large numbers of ballot papers is used to transfer surpluses in elections for the Australian Senate.

The method can be used to fill any number of vacancies. In each instance, the quota is calculated so that it is possible to form a number of quotas equal to the number of vacancies but no more than this. It is found by dividing the number of formal votes by the next whole number above the number of vacancies, and taking the next whole number above the result of the division. For example, in an election with 40,000 votes to fill 7 vacancies, the result of dividing 40,000 by 8 is 5,000 and the quota is 5,001. If 7 candidates each have 5,001 votes, totalling 35,007, there are only 4,993 votes remaining. So only 7 quotas of 5,001 can be formed and this is the smallest number that gives this result. It can be left to the voters to decide how many preferences they wish to indicate. There is no need to compel them to indicate preferences for all candidates.

What happens in practice?

We can check the performance of the various methods of election by examining the results of their use in Parliamentary elections. The first-past-the-post method was used in Queensland between 1942 and 1963. In several elections in that period, the Labor Party won more than half of the seats although it was supported by only a minority of the voters. This method has given grossly distorted results in South Africa. In 1948, the National and Afrikaner parties with 443,719 votes won 78 seats whilst the Opposition parties with 551,590 votes won only 60. Similar distortions have occurred in later elections.

The single-member preferential method is used for most Australian State elections and for the Federal House of Representatives. In the election for the House of Representatives in December 1977, 3,764,215 people, more than 47% of all who recorded formal votes, gave their first preferences to candidates who were not elected. Almost a million Liberal and National Country Party supporters and over 1,800,000 Labour voters might as well have voted informally as their votes had no effect on the results. The numbers of seats won by the various parties did not correspond with their shares of the voters' support. Here are the figures.

House of Representatives, December 1977

	ALP	Lib	NCP	AD	Others
Seats corresponding to votes for parties	49	47	12	12	4
Seats actually won	38	67	19	0	0

This election took place just after a redistribution intended to ensure the application of the 'one-vote-one-value' principle by keeping enrolments within 10% of the average in each State. In spite of this, the number of people whose votes were of no value was the highest ever. In Victoria and Western Australia, more than half the voters were left nominally represented by people they had rejected when voting. It is not possible to predict which parties this method might favour in future elections but it will certainly leave many voters frustrated whenever it is used.

The block vote method has not been used for Parliamentary elections in Australia since 1920. Before that it was used for Senate elections, with very unsatisfactory results. For example, in 1910, 3 vacancies were filled in each of the 6 States. The Labor Party, with just over half of the votes (2,021,090 out of 4,018,218) won all 18 seats.

The majority-preferential method was used for Senate elections from 1920 until 1946. In that period, it gave a majority of the seats to parties with only minority support on 3 occasions, and gave no seats at all to parties supported by nearly half of the voters on 3 occasions. In no case was the representation of the parties even approximately in line with the support of the voters for party candidates. There was very little chance of the Senate being an effective House of Review through all the years when the block-vote and majority-preferential methods were used.

Results with proportional representation

The quota-preferential method of proportional representation has been used for the Senate since 1949 and since 1909 for the House of Assembly in Tasmania, where it is known as the Hare-Clark method. In Senate elections since 1949, party representation in each State and over the Commonwealth has agreed with the voting support for the parties and it has been usual for well over 80% of voters to see their first-preference candidates elected.

The most significant difference between election results in Tasmania and those in other States is that nearly all Tasmanian voters get the representatives they want. It is usual for 7 out of 10 voters to see their first-preference candidates elected and for another two to see candidates of the same parties as their first-preference candidates elected in their own districts. In December 1976, with 7 vacancies in each district, every voter supporting a major party had a choice of at least 8 candidates of his own party. In July 1979, all major party supporters had a choice of at least 7 candidates of their own parties. In each election, more than 9 out of 10 voters found acceptable candidates among those of the major parties. The method has generally tended to encourage parties to broaden their policies so that voters do not need to go outside the major parties to get effective representation.

The record of Parliaments in Tasmania since the introduction of proportional representation differs in some striking ways from the other States. Close agreement between voting support for the parties and the numbers of seats won by their candidates has been the rule in Tasmania. When voting support for parties has changed, the composition of the House has changed correspondingly. The political 'landslide', a well-known happening in places where single-member district methods are used, is unknown in Tasmania with proportional representation.

The quota-preferential method does not depend on the existence of parties. Another system of proportional representation, known as the 'party-list' system, offers voters a choice between lists of candidates submitted by various parties. Although this leads to reasonable agreement between voting support for parties and the numbers of seats they win, it does not allow the voter the wide range of choice within parties that is available with the quota method. Because of this, there has been a tendency, where the

party-list method has been used, for considerable support to be given to minor parties.

With the quota-preferential method, voters can recognise parties if they wish. In elections where there are no defined parties, the method allows voters to assess the candidates as individuals and gives effect accurately to their indications of preferences. Committees and similar bodies elected by this method are likely to retain the confidence of the members of the organizations who elected them, since most of the members will be represented by the people they wanted as their representatives.

The examples and the results of actual elections show that only one of the methods examined meets the requirements set out on page 3. All single-member district methods fail because they must leave large numbers of voters unrepresented and they do not ensure fair representation of bodies of opinion. The block-vote and majority-preferential methods can both leave substantial groups of voters without representation.

Only the quota-preferential method of proportional representation

- **gives a wide choice of candidates**
- **allows voters to be represented by the candidates of their choice**
- **and gives each party or group representation corresponding to its voting strength.**

Of all the methods available, this is the one that can best provide the basis of good government.